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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/626,834

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EXAMINER

THOMAS, LUCY M

ART UNIT

PAPER NUMBER

2836

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
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3 MONTHS

01/30/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/626,834

Applicant(s)

VIRGIN ET AL.

Examiner

Lucy Thomas

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 October 2006.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 40-80 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) 40-80 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claims 1, 59-60, and 79-80 are objected to because of the following informalities: Recitation of "detecting means" in Claim 1, line 8 lacks antecedent basis. Claims 59-60, and 79-80 have similar recitations. Appropriate correction is required.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 41, 43-52, 55, 57-72, and 78-80 are rejected under 35 U.S.C. 102(b) as being anticipated by Thrash (US 5,801,914). Regarding Claim 40, Thrash discloses a line arrangement for electrical systems (Figures 1-3) comprising: an electrical supply line 12 running from a current feed terminal to a current delivery terminal and having at least one current-carrying inner conductor 28 and at least one protective sheath 32 surrounding the inner conductor, a detector element 34 (34 can be a conductive/optical fiber) which runs along the supply line, the detector element having an electrical/optical property, changes of the electrical/optical properties being detectable by a detecting means (see 58 connected to 42 in Figure 3); the detector element being adapted in such a way that the electrical property is irreversibly changed (conductive fiber breaks open) when a local arc originating from the current-carrying inner conductor occurs (Column 1, lines 47-48, Column 3, lines 8-28, Column 6, lines 27-32), and an isolating

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circuit 42, 44 responsive to detecting means and connected to the current feed terminal, the isolating circuit isolating the current-carrying inner conductor from a current source when a change of the electrical property of the detector element is detected by the detecting means (column 7, lines 1-12) .

Regarding Claim 41, Thrash discloses the line arrangement, wherein the detector element is formed in such a way that it irreversibly deteriorates in its electrical property under the local effect of heat (Column 3, lines 24-33, Column 4, lines 19-35).

Regarding Claim 43, Thrash discloses the line arrangement, wherein the detector element comprises at least one of electrical property, which is irreversibly changed when the arc occurs (Column 3, lines 24-33, Column 4, lines 19-35).

Regarding Claim 46, Thrash discloses the detector line following one another in a longitudinal direction of the supply line and running transversely in relation to the longitudinal direction of the supply line are spaced apart from one another by a spacing 0.031 inches (Column 3, lines 21, 34 is in close proximity to the conductor 28, 30 such that it severs due to high temperature).

Regarding Claim 47, Thrash discloses that the detector line consists of a material, which irreversibly changes in its electrical and/or optical property when there is local ingress of an amount of heat that can be generated by the arc (Column 3, lines 24-33, Column 4, lines 19-35, Column 6, lines 30-32).

Regarding Claim 48, Thrash discloses that the detector line consists of an insulating material (polyester yarn), which irreversibly changes in its electrical property from a threshold temperature of about 256 degrees Celsius (column 4, lines 33-37).

Regarding Claim 49, Thrash discloses the line arrangement, wherein the detector line is surrounded by an insulating protective enclosure (Column 3, lines 17-21).

Regarding Claim 50, Thrash discloses the line arrangement, wherein the detector element has a carrier on which the detector line is held (Column 4, lines 25-28, stainless steel fiber twisted around a polyester yarn, polyester yarn reads on the carrier).

Regarding Claim 51, Thrash discloses the line arrangement, wherein the detector line is disposed in the form of conducting tracks on the carrier (Column 4, lines 25-28r).

Regarding Claims 44-45 and 52, Thrash discloses the fiber twisted around a polyester yarn and in the form of meanders (see Figure 1, Column 4, lines 25-28).

Regarding Claim 55, Thrash discloses the line arrangement, wherein the carrier surrounds the supply line at least partially (34 is in close proximity to 28 and partially surrounds it).

Regarding Claims 57-58, Thrash discloses that the carrier forms part of a protective enclosure for the detector line, and that carrier consists of a material, which irreversibly changes under the effect of the arc originating from the inner conductor (polyester yarn melts at around 256 degrees Celsius, Column 4, lines 34-37).

Claim 59 basically recites the elements of Claim 1, except further limiting the detector element comprising a carrier and a detector line, and the electrical property of the detector line being changed, and the carrier being connected to the detector line and consisting of a material which under the local effect of an arc originating from the inner conductor irreversibly deforms. Thrash discloses the detector element comprising a carrier and a detector line (stainless steel fiber twisted around a polyester yarn), and

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the electrical and/or optical property of the detector line changes, and the carrier is connected to the detector line and consisting of a material which under the local effect of an arc originating from the inner conductor irreversibly deforms (polyester yarn melts around 256 degrees Celsius). Therefore, please see the rejection for Claim 1 above.

Claim 60 basically recites the elements of Claim 59, except for the recitation of decomposes instead of deforms. Therefore, please see the rejection for Claim 1 above.

Regarding Claim 61, Thrash discloses that on account of its irreversible change under the local effect of the arc, the carrier irreversibly changes the electrical property of the detector line (insulation melts and conductor severs, see Column 4, lines 50-56).

Regarding Claim 62, Thrash discloses that the carrier locally interrupts the detector line (insulation melts and conductor severs, see Column 4, lines 50-56).

Regarding Claims 63-66, Thrash discloses that the detector element irreversibly changes/changes its electrical/optical property when it is mechanically damaged (mechanical force/stress when the carrier melts, causes the conductor to sever/open).

Regarding Claim 67, Thrash discloses that the detector line lies in a circuit specific to the detector line (see 34 connection in Figure 3).

Regarding Claim 68, Thrash discloses that at least one detector circuit is provided which activates the isolating circuit (see 58 connected to 42, 44 in Figure 3).

Regarding Claims 69-70, Thrash discloses that the detector circuit is associated with the current feed terminal and current delivery terminal (see 42, 44 connection to 40 and 50 in Figure 3).

Regarding Claims 71-72, Thrash discloses that the detector circuit communicates with the isolating circuit by means of an electrical line or by means of light guide (34 can be conducting/optical fiber, therefore communicates electrically/optically).

Regarding Claim 78, Thrash discloses that the detector circuit detects the occurrence of a potential in the detector line other than that of the detector line (overheating is due to arc, which originates at the inner conductor).

Regarding Claims 79-80, Thrash discloses a line arrangement for electrical systems (see Figures 1-13), comprising: an electrical supply line 12 running from a current feed terminal to a current delivery terminal and having at least one current-carrying inner conductor 28 and at least one protective sheath 32 surrounding the inner conductor, a detector element 34 (34 can be conductive/optical fiber twisted around a polyester yarn) which runs along the supply line, said detector element comprising a detector line (fiber reads on detecting line), said detector line having an electrical property/optical, changes of said electrical property being detectable by detecting means (see 58 connected to 42 in Figure 3), said detector line being of a material adapted in such a way that at least its electrical properties are irreversibly changed (fiber breaks or fuse together when the polyester yarn melts due to high temperature and the resistance/optical conductivity changes irreversibly changes), when a local arc originating from the current-carrying inner conductor occurs (Column 1, lines 47-48, Column 3, lines 8-28, Column 6, lines 27-32), and an isolating circuit 42,44 responsive to the detecting means and connected to the current feed terminal, said isolating circuit isolating the current-carrying inner conductor from a current source when a change of

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the electrical property of the detector line is detected by the detecting means (Column 7, lines 1-12).

4. Claims 53-54, 42, 56 and 73-77 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thrash (US 5,801,914) in view of Saito et al. (US 6,243,018).

Regarding Claim 53, Thrash does not disclose that the carrier is given in the form of a strip. Saito discloses the line arrangement, wherein the carrier is given the form of a carrier strip (see 12 in Figure 3). Saito discloses a line arrangement 1 for electrical systems of vehicles (Figure 1, Column 1, lines 10-12), comprising: an electrical supply line running from a current feed terminal to a current delivery terminal and having at least one current-carrying inner conductor (see conductors inside 3, 4, 5, Column 5, lines 59-61) and at least one protective sheath (see outer part of 3, 4, 5, Column 5, lines 46-47) surrounding the inner conductor, a detector element 2 having a carrier, which runs along the supply line, and the carrier strip runs helically around the supply line (see Figures 4, 5b). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the line arrangement of Thrash and to provide a carrier strip as taught by Saito, to facilitate easy handling and flexibility with the location of the detector line. Claim 54, Saito discloses the line arrangement, wherein the carrier strip runs helically around the supply line (see Figures 4, 5b).

Regarding Claims 42 and 56, Thrash does not disclose that the detector element surrounds the supply line (Claim 42) or carrier encloses the supply line substantially completely (Claim 56). Saito discloses a line arrangement 1 for electrical systems of vehicles (Figure 1, Column 1, lines 10-12), comprising: an electrical supply line running

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from a current feed terminal to a current delivery terminal and having at least one current-carrying inner conductor (see conductors inside 3, 4, 5, Column 5, lines 59-61) and at least one protective sheath (see outer part of 3, 4, 5, Column 5, lines 46-47) surrounding the inner conductor, a detector element 2 which runs along the supply line comprising a carrier and a detector line, wherein the carrier substantially surrounds the supply line (see Figures 4, 5b). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the electrical system of Thrash and to provide the detecting element enclosing or substantially surrounds the supply line as taught by Saito to provide enough proximity and coverage for the heat transfer to the detector when overheating occurs.

Regarding Claim 73, Thrash does not disclose more than one detection circuit. Saito discloses a line arrangement 1 for electrical systems of vehicles (Figure 1, Column 1, lines 10-12), comprising: an electrical supply line running from a current feed terminal to a current delivery terminal and having at least one current-carrying inner conductor (see conductors inside 3, 4, 5, Column 5, lines 59-61) and at least one protective sheath (see outer part of 3, 4, 5, Column 5, lines 46-47) surrounding the inner conductor, a detector element 2 which runs along the supply line, and a number of detector circuits (see 51-54 in Figure 14) are provided, and the detector circuits communicate with one another to sense a change the electrical property of the detector element. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the line arrangement of Thrash and to provide a number

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of detector circuit as taught by Saito, to process all the sensed data from all detector line to make a determination to disconnect the supply for the inner conductor.

Regarding Claims 74-75, Saito discloses that the detector circuits communicate with one another via an internal line within the line strand (see Figure 13 and communication lines from 46, 45 to 48), and via an external line outside the line strand (see external communication lines).

Regarding Claims 76-77, Thrash discloses communication using an electrical line/optical line (34 can be conductive/optical fiber).

Response to Arguments

5. Applicant's arguments with respect to claims 40-80 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US 3,588,689 Crawford discloses a line arrangement comprising a detector element which runs along the supply line, made of strip conductors covered with a insulative thermoplastic envelope, to detect faults in a cable system by measuring electrical properties such as resistance or capacitance to locate faults.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lucy Thomas whose telephone number is 571-272-6002. The examiner can normally be reached on Monday - Friday 8:00 AM - 4:30 PM EST.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Sircus can be reached on 571-272-2800 x36. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

LT
January 25, 2007

Stephen W. Jackson
1-26-07

STEPHEN W. JACKSON
PRIMARY EXAMINER